

CHALLENGING THE SUNLIGHT - SKIN CANCER CONNECTION

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In what follows it will be argued that the orthodox explanation of skin cancer and the assumptions about the dangers of sunlight which underpin it are highly misleading and may in fact be contributing unwittingly to the very behaviour responsible for the increase in melanoma.

The orthodox view of the increasing incidence of melanoma depends upon the assumption that regular exposure to sunlight is the main cause of skin cancer, a cause which is now all the more to be feared as the progressive depletion of the ozone layer leads in turn to an increase in the levels of ultraviolet light to which the human body is exposed.

Substantial evidence has now accumulated to challenge the assumption that the increase in melanoma which has occurred since the 1960's is a matter simply of environmental exposure to ultraviolet radiation. Contrary to the conventional wisdom, it would appear that the ability of the body to defend itself against melanoma depends upon sufficient exposure to natural sunlight, and that our ever increasing exposure to artificial light may have far more to do with the incidence of melanoma than has been supposed.

Throughout the history of the human species, exposure to sunlight has figured as a common experience of everyday life. Today, however, we find in modern urbanised countries that our relationship with the environment has changed markedly. By having progressively synthesized the world in which we live, our contact with the natural environment is rapidly becoming minimal. Many people now make their way to work just as the sun is rising and make their way home once the sun has set. For many people the world of artificial light has replaced the world of natural sunlight, as they spend most of their day working indoors. Interestingly, there is evidence which establishes a

higher incidence of melanoma among indoor workers and among those of higher social class. It is also revealing that the distribution of melanomas across the body is often higher on parts of the body least exposed to sunlight. (1)

Compounding the problem are a number of environmental factors which may actually increase the sensitivity of our skin to sunlight. By 1964 more than 100 chemical agents, including many commonly used drugs, had been documented as increasing the sensitivity of the skin to natural light. Within the class of photosensitizing drugs are found hypoglycaemic, antihypertensive, tranquilliser, broad spectrum antibiotic drugs, and even sunscreens and tanning lotions. (2) Around the same period reports of photoallergic reactions to artificial sweetener cyclamate was added to the list in 1967. (3)

The processing and refining of our food is also thought to increase skin sensitivity and thus reduce skin tolerance to sunlight. (4) There is evidence that a deficiency of B6 in the diet, for example, increases photosensitivity to ultraviolet light. Vitamin B6 levels in grains are considerably diminished in the milling and refining process, with white bread containing only 22% of Vitamin B6 compared with wholemeal bread (5). On the other hand it is ironic that our cereals are fortified artificially with other chemicals such as riboflavin, which is itself a potential photosensitizer.

While factors such as the above increase our sensitivity to sunlight, the beneficial effect of sunlight on the regulation of our hormonal system in a way that helps to prevent melanoma needs to be addressed. For many years female sex hormones, for instance, have been suspected as being important in the induction of melanomas. It has been shown that there are oestrogen receptors in melanoma cells and there is evidence to suggest that oral contraceptives may increase the risk of the disease. (6) Women who take high-dose oral contraceptives or who become pregnant sometimes develop patchy pigmentation around their face, as increased oestrogen levels appear to stimulate pigment synthesis in melanocytes. (7) It is also known that the human ovulatory cycle is regulated and normalised by natural light. (8)

In regard to the rising incidence of melanoma, one hypothesis is that the healthy formation of skin pigmentation is regulated in subtle ways by light entering the body through the eyes as well as the skin. Since different regions

of the light spectrum are involved in maintaining a delicate balance between these two pathways, artificial indoor light with its distorted spectral composition and monotony compared to daylight, tends to stress the feedback and complementary mechanisms between the two systems, thus disrupting the production of adequate levels of protective melanin in the skin. As we increase our exposure to artificial light, we may thus be undermining the body's own defense mechanisms which would otherwise protect us against everyday exposure to the harmful rays of the sun.

An illustration of the importance of sufficient exposure to sunlight relates to changes which occur in the surface fat layer of the skin. This layer offers the first protection against ultraviolet light. Earlier studies showed that ultraviolet radiation seemed to increase the cholesterol content of the skin, and it was suggested that the increased cholesterol may actually predispose the skin to tumour. (9) Subsequent and more detailed studies have shown, however, that the higher the cholesterol level of the skin, the greater was its resistance to the harmful effects of ultraviolet radiation. (10). Again the optic light connection is of relevance here. Lipid metabolism and blood cholesterol levels are regulated by light affecting the optic pathway to the pineal system, and again different spectral bands such as those manifest in artificial light appear to affect the eye and skin intake systems in ways which degrade the body's protective mechanisms against melanoma.

Vitamin D synthesis is another case in point. Recent research has demonstrated that the prohormone Vitamin D levels are regulated conjointly by the pineal gland and exposure of the skin to sunshine, thus emphasising the subtle interconnection between the optic and skin stimulation by light. (11) This is especially significant as evidence accumulates suggesting that Vitamin D inhibits melanoma and other cancers. (12) Using unnatural fat sources, such as polyunsaturated margarines to manipulate dietary fat can also affect the balance of the mechanisms which regulate the optimum fat composition of the skin. The possibility that the manipulation of dietary fat is an important factor in the aetiology of melanoma has also been mooted. (13).

The artificial colours with which we have painted and decorated our environment have served to ensure that for large periods of time the nature of the light entering our eyes is vastly different from the light reflected from the natural outdoors of meadow, forest and field. In addition the use of glass, sometimes plastic coated or tinted, means, for example, that the sunlight entering our building or vehicle is filtered or refined by the removal of certain wavelengths of sunlight by the glass itself. This diminished sunlight is usually supplemented by artificial lighting from incandescent or fluorescent lights.

It is clear then that apart from the progressively rarer occasions when we step outdoors, we are continuously bathing in artificial light. Yet, dare we step outside? Health departments warn us constantly through the media to beware of the skin cancer demon called sunlight. We are urged to protect ourselves from direct sunlight by using sunscreens. We do this winningly, but we fail to recognise that when we coat our skin with sunscreens or tanning oils, and even wear sunglasses, the sunlight light reaching the covered areas of skin and our eyes has been modified or refined by the absorption of certain wavelength components. Exposure to natural sunlight has again been reduced

or transformed into exposure to artificial light.

This bizarre situation has arisen because little attention has been paid by health educators to the accumulating literature which points to the fact that the substitution of artificial light for natural sunlight is an important etiological factor in understanding the melanoma enigma. Lest the discussion be misunderstood, let us make plain that the recommendation is not that we should all run off to the beach at the first blush of summer sun. On the contrary, the point is that regular daily exposure, *not excessive exposure and sporadic*, to sunlight is an important measure in the prevention of melanoma. It needs also to be recognized that some of the very chemical substances upon which we have come to rely to make us healthy may inadvertently be contributing to our ill health.

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